

Claims

1. A system for irradiating a product with a source of radiation comprising, in combination,

a) a source providing radiation to penetrate and irradiate the product; some of the radiation exiting the product; and

b) a reflector of a high density, low Z material positioned to receive radiation exiting the product and to reflect back a some portion of the radiation exiting the product to re-irradiate said product.

2. A system as in claim 1 wherein the product has a top surface, an opposite bottom surface, and side surfaces wherein

a) the source of radiation is positioned to irradiate the top surface of the product and penetrate the product; some of said radiation exiting on said opposite bottom surface and the side surfaces of the product; and wherein

b) said reflector is positioned to receive and reflect back radiation exiting said product to re-irradiate the product from said bottom and side surfaces.

3. A method of irradiating a selected product comprising, in combination,

a) directing radiation of sufficient energy to cause some of said radiation

penetrate and exit the product;

b) positioning a reflector of a selected high density, low Z material at least three quarters inch thick to receive radiation exiting the product and to reflect said radiation; and

c) directing the reflected radiation back to irradiate said product.

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4. A system as in Claim 1 wherein said reflector comprises boron carbide of at least three quarters inch in thickness.

5. A system as in Claim 1 wherein said reflector comprises boron of at least three quarters inch in thickness.

6. A system as in claim 1 wherein said reflector comprises carbon of at least three quarters inch in thickness.

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7. A system as in Claim 1 wherein

a) the product has a top surface, a bottom surface and side surfaces and the radiation enter the top surface;

b) said reflector comprises a low Z, high density material configured to reflect

ray to the bottom surface of the product as well as to the sides of the product.

8. A system as in claim 1 wherein the reflector may be of boron, boron carbide or carbon of at least 10 cm in thickness to reflect X-rays or gamma rays.

5       9. A system as in claim 8 wherein the reflector is configured to reflect the radiation to selected areas of the product being irradiated.

10. A system for irradiating with X-rays a product which product has top, bottom and sides surfaces comprising, in combination,

a) a source of for providing X-rays directed to irradiate the top surface of the product;

b) said source of X-rays providing X-rays suitable for penetrating at least 4 cms of water equivalent product;

15       c) a reflector of a high density, low Z material positioned to receive X-rays exiting the product and to reflect back a major portion of the X-rays exiting the product to re-irradiate said product;

d) said reflector being of boron carbide and being of a thickness of at least 10 cms in thickness,

e) said reflector being configured to reflect X-rays back to the sides of the product as well as to the bottom of the product; and

f) said reflector being positioned adjacent the bottom surface and side surfaces.

5        11. A system as in Claim 10 wherein said reflected X-rays are selectively directed to specific areas of the product.

12. A system as in Claim 1 wherein said reflector is formed as recess for containing the product.